set,

an act of preprocessing the data set to prepare the data set for modeling;

an act of modeling the preprocessed data set to describe relationships between the

attributes and the one or more target values; and

an act of providing recommendations such that the recipe is optimized.

2.   A method as defined in claim 1, wherein the act of preprocessing the data set further comprises:

an act of cleaning the generated data set;

an act of interpolating the generated data set;

an act of normalizing the generated data set; and

an act of generating new attributes.

3.   A method as defined in claim 1, wherein the recipe is a fertilizer recipe for use in an agricultural field.

4.   A method as defined in claim 1, wherein a crop yield is included in the one or more target values.

5.   A method as defined in claim 1, further wherein the relationships include one or more clusters, wherein a first cluster from first spatial data corresponding to a first spatial environment is used to optimize a recipe for a second spatial environment.

6.   A computer program product having computer executable instructions for executing the acts recited in claim 1.

7.   (Amended) In a system including one or more spatial databases corresponding to one or more spatial environments, a system for knowledge discovery from the one or more

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spatial databases, the system comprising:

a user interface; and

a spatial data modeling and analysis module (SDAM module) for extracting knowledge

from the one or more spatial databases, the SDAM module comprising:

a data generation and manipulation module for loading the data set from the one

or more spatial databases based on designated attributes, wherein the

attributes are selected and supplied to the data generation and

manipulation module by a user through the user interface;

a data inspection module for providing spatial statistics on the loaded data set;

a data preprocessing module for preparing the data set for modeling, wherein the

data preprocessing module removes errors from the data set;

a data partitioning module for dividing the data set into homogenous data

segments which improve data modeling; and

a modeling module for describing relationships between the attributes and one or

more target values, wherein the relationships are obtained from the

partitioned data set.

8.   A system as defined in claim 7, wherein the SDAM module further comprises an integration module for enhancing the knowledge generated from the one or more spatial databases.

9.   A system as defined in claim 7, wherein the preprocessing module further comprises:

a cleaning and filtering module for removing duplicate data and removing noise from the loaded data set;

a data interpolation module for computing common values for a common set of locations;

a data normalization module for transforming the loaded data set to a normal

distribution and for scaling the loaded data set to a range;

a data discretization module for use in modeling the loaded data set;

a generating new attributes module for combining existing attributes into a single attribute;

a feature selection module for reducing the attributes identified by a user such that irrelevant attributes may be removed; and

a feature extraction module for reducing a dimensionality of the loaded data set.

10.   A system as defined in claim 7, further comprising a recommendation module, wherein the recommendation module optimizes a recipe for a spatial environment.

11.   A system as defined in claim 10, wherein the recommendation module includes at least one of: a fertilization module for optimizing a fertilizer recipe to be applied to an agricultural field; an irrigation module for optimizing a water recipe to be applied to a field; and an equipment module for optimizing a recipe to be applied to equipment.

12.   A system as defined in claim 11, wherein the recommendation module includes at least one of: a pesticide module, a herbicide module, and a seed-spacing module.

13.   A system as defined in claim 7, wherein each of the data generation and manipulation module, the data inspection, the data preprocessing module, the data partitioning module, and the modeling module can be independently controlled by the user through the user interface.

14.   (Amended) In a networked computer system that includes a client and a server, wherein the server maintains spatial data sets, a method for analyzing the spatial data sets over the network, the method comprising the steps for:

applying spatial data mining functions to the spatial data sets, the spatial data sets

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generated using identified attributes selected by a user, wherein said

spatial data mining functions comprise the steps for

modeling the spatial data sets to provide estimation of predetermined

parameters at predetermined points; and

classifying the spatial data sets into predetermined classes; and

using the estimation of the predetermined parameter to accomplish a

predetermined purpose, wherein the predetermined purpose includes at

least one of determining how the predicted variable affects a

predetermined target variable, providing recommendations as to how to

achieve a predetermined target variable, and creating new spatial data

mining methods.

15.   A method as defined in claim 14, further comprising the step for combining different programming environments to allow different programming environments to function on one server.

16.   A method as defined in claim 15, wherein the step for combining different programming environments comprises a unified controller.

17.   A method as defined in claim 14, wherein the spatial data set is generated by a spatial data simulator.

18.   A method as defined in claim 14, wherein said spatial data mining functions further comprise the step for partitioning said data set into more homogenous portions.

19.   A method as defined in claim 14, wherein said spatial data mining functions further comprise the step for integrating said modeling and classifications steps.

20.   A computer program product having computer executable instructions for performing the steps recited in claim 14.

21.   (Amended) In an environment including spatial data relating to a specific agricultural field, a method for analyzing the spatial data comprising steps for:

    applying spatial data mining functions to the spatial data, the spatial data

        generated using identified attributes selected by a user, wherein said

        spatial data mining functions comprise the steps for

        modeling the spatial data to provide estimation of predetermined

            parameters at predetermined points; and

        classifying the spatial data into predetermined classes; and

    using the estimation of the spatial data analysis to optimize the treatment of the

        agricultural field to produce a predetermined yield.

22.   A method as defined in claim 21, wherein said spatial data consists of past and present data of a specific agricultural field.

23.   A method as defined in claim 21, wherein the step for applying spatial data mining functions occurs in a network environment.